



SEQUENCE LISTING

<110> Bruck, Claudine  
Godart, Stephane Andre Georges  
Marc-Hand, Martine

<120> Fusion Proteins Comprising HIV-1 TAT  
and/or Nef Proteins

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<140> 09/509,239

<141> 2000-03-23

<150> PCT/EP98/06040

<151> 1998-09-17

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<151> 1997-09-26

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<213> Pichia pastoris

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cgtggtgcta gcggttattt accagagcat acgttagaat ctaaagcact tgcttttgca	180
caacaggctg attattttaga gcaagattta gcaatgacta aggatggctg tttagtggtt	240
attcacgata acttttttaga tggcttgact gatgttgcca aaaaattccc acatcgatc	300
cgtaaagatg gccgttacta tgtcatcgac tttaccttaa aagaaattca aagtttagaa	360
atgacagaaa actttgaaac catggccacg tgtgatcaga gctcaactag tggccaccat	420
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<210> 7

<211> 144

<212> PRT

<213> Pichia pastoris

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		20						25					30		
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
	35						40					45			
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
	50					55					60				
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
65				70					75					80	
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
			85					90					95		
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
		100						105					110		
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
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Ala	Thr	Cys	Asp	Gln	Ser	Ser	Thr	Ser	Gly	His	His	His	His	His	His
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<213> Pichia pastoris

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ggagcaatca caagtagcaa tacagcagct accaatgctg cttgtgcctg gctagaagca	180
caagaggagg aggaggtggg ttttccagtc acacctcagg tacctttaag accaatgact	240
tacaaggcag ctgtagatct tagccacttt ttaaaagaaa aggggggact ggaagggcta	300
attcactccc aacgaagaca agatatcctt gatctgtgga tctaccacac acaaggctac	360
ttccttgatt ggcagaacta cacaccaggg ccaggggtca gatatccact gaccttttga	420
tggtgctaca agctagtacc agttgagcca gataaggtag aagaggccaa taaaggagag	480
aacaccagct tgttacacc tgtgagcctg catggaatgg atgacctga gagagaagtg	540
ttagagtgga ggtttgacag ccgcctagca tttcatcacg tggcccgaga gctgcatccg	600
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<211> 215

<212> PRT

<213> Pichia pastoris

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Arg	Glu	Arg	Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala
			20					25					30		
Ala	Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr
		35					40					45			
Ala	Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu
		50				55					60				
Glu	Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr
65					70				75					80	
Tyr	Lys	Ala	Ala	Val	Asp	Leu	Ser	His	Phe	Leu	Lys	Glu	Lys	Gly	Gly
			85					90						95	
Leu	Glu	Gly	Leu	Ile	His	Ser	Gln	Arg	Arg	Gln	Asp	Ile	Leu	Asp	Leu
		100						105					110		
Trp	Ile	Tyr	His	Thr	Gln	Gly	Tyr	Phe	Pro	Asp	Trp	Gln	Asn	Tyr	Thr
		115					120						125		
Pro	Gly	Pro	Gly	Val	Arg	Tyr	Pro	Leu	Thr	Phe	Gly	Trp	Cys	Tyr	Lys
		130				135					140				
Leu	Val	Pro	Val	Glu	Pro	Asp	Lys	Val	Glu	Glu	Ala	Asn	Lys	Gly	Glu
145					150				155					160	
Asn	Thr	Ser	Leu	Leu	His	Pro	Val	Ser	Leu	His	Gly	Met	Asp	Asp	Pro
			165					170					175		
Glu	Arg	Glu	Val	Leu	Glu	Trp	Arg	Phe	Asp	Ser	Arg	Leu	Ala	Phe	His
			180					185					190		
His	Val	Ala	Arg	Glu	Leu	His	Pro	Glu	Tyr	Phe	Lys	Asn	Cys	Thr	Ser
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<211> 288

<212> DNA

<213> *Pichia pastoris*

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aaagccttag gcatctccta tggcaggaag aagcggagac agcgacgaag acctcctcaa	180
ggcagtcaga ctcatcaagt ttctctatca aagcaaccba cctcccaatc ccgagggggac	240
ccgacaggcc cgaaggaaac tagtggccac catcaccatc accattaa	288

<210> 11

<211> 95

<212> PRT

<213> *Pichia pastoris*

<400> 11

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Gln Pro Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe
      20           25           30
His Cys Gln Val Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly
      35           40           45
Arg Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr
      50           55           60
His Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Arg Gly Asp
      65           70           75           80
Pro Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His
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<210> 12

<211> 909

<212> DNA

<213> *Pichia pastoris*

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ggagcaatca caagtagcaa tacagcagct accaatgctg cttgtgcctg gctagaagca      180
caagaggagg aggaggtggg ttttccagtc acacctcagg tacctttaag accaatgact      240
tacaaggcag ctgtagatct tagccacttt ttaaaagaaa aggggggact ggaagggcta      300
attcactccc aacgaagaca agatatcctt gatctgtgga tctaccacac acaaggctac      360
ttccctgatt ggcagaacta cacaccaggg ccaggggtca gatatccact gacctttgga      420
tggtgctaca agctagtacc agttgagcca gataaggtag aagaggccaa taaaggagag      480
aacaccagct tgttacaccc tgtgagcctg catggaatgg atgaccctga gagagaagtg      540
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gagtacttca agaactgcac tagtgagcca gtagatccta gactagagcc ctggaagcat      660
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tgccaagttt gtttcataac aaaagcctta ggcattctct atggcaggaa gaagcggaga      780
cagcgacgaa gacctcctca aggcagtcag actcatcaag tttctctatc aaagcaaccc      840
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<211> 302

<212> PRT

<213> Pichia pastoris

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			20					25					30		
Ala	Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr
			35				40					45			
Ala	Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu
			50				55				60				
Glu	Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr
65					70					75					80
Tyr	Lys	Ala	Ala	Val	Asp	Leu	Ser	His	Phe	Leu	Lys	Glu	Lys	Gly	Gly
				85					90					95	
Leu	Glu	Gly	Leu	Ile	His	Ser	Gln	Arg	Arg	Gln	Asp	Ile	Leu	Asp	Leu
			100					105					110		
Trp	Ile	Tyr	His	Thr	Gln	Gly	Tyr	Phe	Pro	Asp	Trp	Gln	Asn	Tyr	Thr
			115				120					125			
Pro	Gly	Pro	Gly	Val	Arg	Tyr	Pro	Leu	Thr	Phe	Gly	Trp	Cys	Tyr	Lys
			130				135				140				
Leu	Val	Pro	Val	Glu	Pro	Asp	Lys	Val	Glu	Glu	Ala	Asn	Lys	Gly	Glu
145					150					155					160
Asn	Thr	Ser	Leu	Leu	His	Pro	Val	Ser	Leu	His	Gly	Met	Asp	Asp	Pro
				165					170					175	
Glu	Arg	Glu	Val	Leu	Glu	Trp	Arg	Phe	Asp	Ser	Arg	Leu	Ala	Phe	His
			180					185					190		
His	Val	Ala	Arg	Glu	Leu	His	Pro	Glu	Tyr	Phe	Lys	Asn	Cys	Thr	Ser
			195				200					205			
Glu	Pro	Val	Asp	Pro	Arg	Leu	Glu	Pro	Trp	Lys	His	Pro	Gly	Ser	Gln
			210				215				220				
Pro	Lys	Thr	Ala	Cys	Thr	Asn	Cys	Tyr	Cys	Lys	Lys	Cys	Cys	Phe	His
225					230					235					240
Cys	Gln	Val	Cys	Phe	Ile	Thr	Lys	Ala	Leu	Gly	Ile	Ser	Tyr	Gly	Arg
				245					250					255	
Lys	Lys	Arg	Arg	Gln	Arg	Arg	Arg	Pro	Pro	Gln	Gly	Ser	Gln	Thr	His
				260				265					270		
Gln	Val	Ser	Leu	Ser	Lys	Gln	Pro	Thr	Ser	Gln	Ser	Arg	Gly	Asp	Pro
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<212> DNA

<213> *Pichia pastoris*

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cgtaaagatg gccgttacta tgtcatcgac tttaccttaa aagaaattca aagtttagaa      360
atgacagaaa actttgaaac catgggtggc aagtgggtcaa aaagtagtgt gggtggatgg      420
cctactgtaa gggaaagaat gagacgagct gagccagcag cagatggggg gggagcagca      480
tctcgagacc tggaaaaaca tggagcaatc acaagtagca atacagcagc taccaatgct      540
gcttgtgcct ggctagaagc acaagaggag gaggaggtgg gttttccagt cacacctcag      600
gtacctttta gaccaatgac ttacaaggca gctgtagatc ttagccactt tttaaaagaa      660
aaggggggac tgggaagggt aattcactcc caacgaagac aagatatact tgatctgtgg      720
atctaccaca cacaaggcta cttccctgat tggcagaact acacaccagg gccaggggtc      780
agatatccac tgaccttttg atggtgctac aagctagtac cagttgagcc agataaggta      840
gaagaggcca ataaaggaga gaacaccagc ttgttacacc ctgtgagcct gcatggaatg      900
gatgaccctg agagagaagt gttagagtgg aggtttgaca gccgcctagc atttcatcac      960
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<210> 15

<211> 324

<212> PRT

<213> *Pichia pastoris*

<400> 15

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Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln Ala Asp Tyr Leu
 35           40           45
Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu Val Val Ile His
 50           55           60
Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys Lys Phe Pro His
 65           70           75           80
Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp Phe Thr Leu Lys
 85           90           95
Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu Thr Met Gly Gly
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100	105	110
Lys Trp Ser Lys Ser Ser Val Val Gly Trp Pro Thr Val Arg Glu Arg		
115	120	125
Met Arg Arg Ala Glu Pro Ala Ala Asp Gly Val Gly Ala Ala Ser Arg		
130	135	140
Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr Ala Ala Thr		
145	150	155
Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu Val Gly		
165	170	175
Phe Pro Val Thr Pro Gln Val Pro Leu Arg Pro Met Thr Tyr Lys Ala		
180	185	190
Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu Glu Gly		
195	200	205
Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu Trp Ile Tyr		
210	215	220
His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro Gly Pro		
225	230	235
Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys Leu Val Pro		
245	250	255
Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu Asn Thr Ser		
260	265	270
Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro Glu Arg Glu		
275	280	285
Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His His Val Ala		
290	295	300
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<211> 1290

<212> DNA

<213> *Pichia pastoris*

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cgtggtgcta gcggttattt accagagcat acgttagaat ctaaagcact tgcgtttgca	180
caacaggctg attatttaga gcaagattta gcaatgacta aggatggtcg tttagtgggt	240
attcacgata acttttttaga tggcttgact gatgttgcca aaaaattccc acatcgatcat	300
cgtaaagatg gccgttacta tgatcatcgac tttaccttaa aagaaattca aagtttagaa	360
atgacagaaa actttgaaac catgggtggc aagtgggtcaa aaagtagtgt gggttgatgg	420



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gcttgtgcct	ggctagaagc	acaagaggag	gaggaggtgg	gttttccagt	cacacctcag	600
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aagggggggac	tggaaggggt	aattcactcc	caacgaagac	aagatatacct	tgatctgtgg	720
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gtggcccgag	agctgcatcc	ggagtacttc	aagaactgca	ctagttagcc	agtagatcct	1020
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<210> 17

<211> 411

<212> PRT

<213> *Pichia pastoris*

<400> 17

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Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro	Glu	His
			20					25					30		
Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp	Tyr	Leu
	35						40					45			
Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val	Ile	His
	50					55					60				
Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe	Pro	His
65				70					75					80	
Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr	Leu	Lys
			85					90					95		
Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met	Gly	Gly
			100					105					110		
Lys	Trp	Ser	Lys	Ser	Ser	Val	Val	Gly	Trp	Pro	Thr	Val	Arg	Glu	Arg
	115					120						125			
Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala	Ala	Ser	Arg
	130					135					140				
Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr	Ala	Ala	Thr
145				150					155					160	
Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu	Glu	Val	Gly

	165		170		175
Phe Pro Val Thr	Pro Gln Val	Pro Leu Arg	Pro Met Thr	Tyr Lys Ala	
	180		185		190
Ala Val Asp Leu	Ser His Phe	Leu Lys Glu	Lys Gly Gly	Leu Glu Gly	
	195		200		205
Leu Ile His Ser	Gln Arg Arg	Gln Asp Ile	Leu Asp Leu	Trp Ile Tyr	
	210		215		220
His Thr Gln Gly	Tyr Phe Pro	Asp Trp Gln	Asn Tyr Thr	Pro Gly Pro	
	225		230		235
Gly Val Arg Tyr	Pro Leu Thr	Phe Gly Trp	Cys Tyr Lys	Leu Val Pro	
	245		250		255
Val Glu Pro Asp	Lys Val Glu	Glu Ala Asn	Lys Gly Glu	Asn Thr Ser	
	260		265		270
Leu Leu His Pro	Val Ser Leu	His Gly Met	Asp Asp Pro	Glu Arg Glu	
	275		280		285
Val Leu Glu Trp	Arg Phe Asp	Ser Arg Leu	Ala Phe His	His Val Ala	
	290		295		300
Arg Glu Leu His	Pro Glu Tyr	Phe Lys Asn	Cys Thr Ser	Glu Pro Val	
	305		310		315
Asp Pro Arg Leu	Glu Pro Trp	Lys His Pro	Gly Ser Gln	Pro Lys Thr	
	325		330		335
Ala Cys Thr Asn	Cys Tyr Cys	Lys Lys Cys	Cys Phe His	Cys Gln Val	
	340		345		350
Cys Phe Ile Thr	Lys Ala Leu	Gly Ile Ser	Tyr Gly Arg	Lys Lys Arg	
	355		360		365
Arg Gln Arg Arg	Arg Pro Pro	Gln Gly Ser	Gln Thr His	Gln Val Ser	
	370		375		380
Leu Ser Lys Gln	Pro Thr Ser	Gln Ser Arg	Gly Asp Pro	Thr Gly Pro	
	385		390		395
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<211> 981

<212> DNA

<213> *Pichia pastoris*

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cttgcgtttg cacaacaggc tgattattta gagcaagatt tagcaatgac taaggatggt	180
cgtttagtgg ttattcacga tcacttttta gatggcttga ctgatgttgc gaaaaaatc	240
ccacatcgtc atcgtaaaga tggccgttac tatgtcatcg actttacctt aaaagaaatt	300

caaagtttag	aaatgacaga	aaactttgaa	accatgggtg	gcaagtgggc	aaaaagtagt	360
gtgggttgat	ggcctactgt	aagggaaga	atgagacgag	ctgagccagc	agcagatggg	420
gtgggagcag	catctcgaga	cctggaaaaa	catggagcaa	tcacaagtag	caatacagca	480
gctaccaatg	ctgcttgtgc	ctggctagaa	gcacaagagg	aggaggaggt	gggttttcca	540
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tttttaaaag	aaaagggggg	actggaagg	ctaattcact	cccaacgaag	acaagatatc	660
cttgatctgt	ggatctacca	cacacaaggc	tacttccttg	attggcagaa	ctacacacca	720
gggccagggg	tcagatatcc	actgaccttt	ggatgggtgct	acaagctagt	accagttgag	780
ccagataagg	tagaagaggc	caataaagga	gagaacacca	gcttggttaca	ccctgtgagc	840
ctgcatggaa	tggatgaccc	tgagagagaa	gtgtagtagt	ggaggtttga	cagccgccta	900
gcatttcata	acgtggcccg	agagctgcat	ccggagtact	tcaagaactg	cactagtggc	960
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<210> 19

<211> 326

<212> PRT

<213> *Pichia pastoris*

<400> 19

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
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Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20					25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
		35					40					45			
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
	50					55					60				
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
65				70				75						80	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
				85				90						95	
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
			100					105					110		
Gly	Gly	Lys	Trp	Ser	Lys	Ser	Ser	Val	Val	Gly	Trp	Pro	Thr	Val	Arg
		115				120						125			
Glu	Arg	Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala	Ala
	130					135					140				
Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr	Ala
145					150				155					160	
Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu	Glu
				165					170				175		
Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr	Tyr
			180					185					190		

Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu  
 195 200 205  
 Glu Gly Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu Trp  
 210 215 220  
 Ile Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro  
 225 230 235 240  
 Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys Leu  
 245 250 255  
 Val Pro Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu Asn  
 260 265 270  
 Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro Glu  
 275 280 285  
 Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His His  
 290 295 300  
 Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser Gly  
 305 310 315 320  
 His His His His His His  
 325

<210> 20

<211> 1242

<212> DNA

<213> *Pichia pastoris*

<400> 20

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cttgcgtttg cacaacaggc tgattattta gagcaagatt tagcaatgac taaggatggt	180
cgtttagtgg ttattcacga tcacttttta gatggcttga ctgatgttgc gaaaaaattc	240
ccacatcgtc atcgtaaaga tggccgttac tatgtcatcg actttacctt aaaagaaatt	300
caaagtttag aaatgacaga aaactttgaa accatgggtg gcaagtgggtc aaaaagtagt	360
gtggttggtg ggccactgt aagggaaga atgagacgag ctgagccagc agcagatggg	420
gtgggagcag catctcgaga cctggaaaaa catggagcaa tcacaagtag caatacagca	480
gctaccaatg ctgcttgtgc ctggctagaa gcacaagagg aggaggagggt gggttttcca	540
gtcacacctc aggtaccttt aagaccaatg acttacaagg cagctgtaga tcttagccac	600
tttttaaaag aaaagggggg actggaaggg ctaattcact cccaacgaag acaagatatc	660
cttgatctgt ggatctacca cacacaaggc tacttccttg attggcagaa ctacacacca	720
gggccagggg tcagatatcc actgaccttt ggatggtgct acaagctagt accagttgag	780
ccagataagg tagaagaggc caataaagga gagaacacca gcttggttaca ccctgtgagc	840
ctgcatggaa tggatgacct tgagagagaa gtgtagagt ggaggtttga cagccgccta	900
gcatttcatc acgtggcccg agagctgcat ccggagtact tcaagaactg cactagttag	960
ccagtagatc ctagactaga gccctggaag catccaggaa gtcagcctaa aactgcttgt	1020
accaattgct attgtaaaaa gtgttgcttt cattgccaag tttgtttcat aacaaaagcc	1080

ttaggcatct cctatggcag gaagaagcgg agacagcgac gaagacctcc tcaaggcagt	1140
cagactcatc aagtttctct atcaaagcaa cccacctccc aatccccgagg ggacccgaca	1200
ggcccgaagg aaactagtgg ccaccatcac catcaccatt aa	1242

<210> 21

<211> 413

<212> PRT

<213> *Pichia pastoris*

<400> 21

Met	Asp	Pro	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
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Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
			20					25					30		
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
		35					40					45			
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
	50					55					60				
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
65				70					75					80	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
			85						90					95	
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Met
			100					105					110		
Gly	Gly	Lys	Trp	Ser	Lys	Ser	Ser	Val	Val	Gly	Trp	Pro	Thr	Val	Arg
		115				120						125			
Glu	Arg	Met	Arg	Arg	Ala	Glu	Pro	Ala	Ala	Asp	Gly	Val	Gly	Ala	Ala
	130					135					140				
Ser	Arg	Asp	Leu	Glu	Lys	His	Gly	Ala	Ile	Thr	Ser	Ser	Asn	Thr	Ala
145					150					155				160	
Ala	Thr	Asn	Ala	Ala	Cys	Ala	Trp	Leu	Glu	Ala	Gln	Glu	Glu	Glu	Glu
			165						170					175	
Val	Gly	Phe	Pro	Val	Thr	Pro	Gln	Val	Pro	Leu	Arg	Pro	Met	Thr	Tyr
		180					185						190		
Lys	Ala	Ala	Val	Asp	Leu	Ser	His	Phe	Leu	Lys	Glu	Lys	Gly	Gly	Leu
	195						200					205			
Glu	Gly	Leu	Ile	His	Ser	Gln	Arg	Arg	Gln	Asp	Ile	Leu	Asp	Leu	Trp
	210					215					220				
Ile	Tyr	His	Thr	Gln	Gly	Tyr	Phe	Pro	Asp	Trp	Gln	Asn	Tyr	Thr	Pro
225				230						235				240	
Gly	Pro	Gly	Val	Arg	Tyr	Pro	Leu	Thr	Phe	Gly	Trp	Cys	Tyr	Lys	Leu
			245						250					255	
Val	Pro	Val	Glu	Pro	Asp	Lys	Val	Glu	Glu	Ala	Asn	Lys	Gly	Glu	Asn

260	265	270
Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro Glu		
275	280	285
Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His His		
290	295	300
Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser Glu		
305	310	315
Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser Gln Pro		
325	330	335
Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe His Cys		
340	345	350
Gln Val Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly Arg Lys		
355	360	365
Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr His Gln		
370	375	380
Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Arg Gly Asp Pro Thr		
385	390	395
Gly Pro Lys Glu Thr Ser Gly His His His His His His		
405	410	

<210> 22

<211> 288

<212> DNA

<213> *Pichia pastoris*

<400> 22

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gctgccttag gcatctccta tggcaggaag aagcggagac agcgacgaag acctcctcaa	180
ggcagtcaga ctcatcaagt ttctctatca aagcaacca cctcccaatc caaaggggag	240
ccgacaggcc cgaaggaaac tagtggccac catcaccatc accattaa	288

<210> 23

<211> 95

<212> PRT

<213> *Pichia pastoris*

<400> 23

Met Glu Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser	
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Gln Pro Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe	
20	25
His Cys Gln Val Cys Phe Ile Thr Ala Ala Leu Gly Ile Ser Tyr Gly	

35                      40                      45  
 Arg Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr  
 50                      55                      60  
 His Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Lys Gly Glu  
 65                      70                      75                      80  
 Pro Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His  
                     85                      90                      95

<210> 24  
 <211> 909  
 <212> DNA  
 <213> *Pichia pastoris*

<400> 24  
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 ggagcaatca caagtagcaa tacagcagct accaatgctg cttgtgcctg gctagaagca 180  
 caagaggagg aggaggtggg ttttccagtc acacctcagg tacctttaag accaatgact 240  
 tacaaggcag ctgtagatct tagccacttt ttaaaagaaa aggggggact ggaagggcta 300  
 attcactccc aacgaagaca agatatacctt gatctgtgga tctaccacac acaaggctac 360  
 ttccctgatt ggcagaacta cacaccaggg ccaggggtca gatataccact gacctttgga 420  
 tgggtgtaca agctagtacc agttgagcca gataaggtag aagaggccaa taaaggagag 480  
 aacaccagct tgttacaccc tgtgagcctg catggaatgg atgacctga gagagaagtg 540  
 ttagagtggg ggtttgacag ccgcctagca tttcatcacg tggcccgaga gctgcatccg 600  
 gagtacttca agaactgcac tagtgagcca gtagatccta gactagagcc ctggaagcat 660  
 ccaggaagtc agcctaaaac tgcttgtacc aattgctatt gtaaaaagtg ttgctttcat 720  
 tgccaagttt gtttcataac agctgcctta ggcatctcct atggcaggaa gaagcggaga 780  
 cagcgacgaa gacctcctca aggcagtcag actcatcaag tttctctatc aaagcaaccc 840  
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 caccattaa 909

<210> 25  
 <211> 302  
 <212> PRT  
 <213> *Pichia pastoris*

<400> 25  
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 Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Asp Gly Val Gly Ala  
                     20                      25                      30  
 Ala Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr  
                     35                      40                      45

Ala Ala Thr Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu  
 50 55 60  
 Glu Val Gly Phe Pro Val Thr Pro Gln Val Pro Leu Arg Pro Met Thr  
 65 70 75 80  
 Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly  
 85 90 95  
 Leu Glu Gly Leu Ile His Ser Gln Arg Arg Gln Asp Ile Leu Asp Leu  
 100 105 110  
 Trp Ile Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr  
 115 120 125  
 Pro Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys  
 130 135 140  
 Leu Val Pro Val Glu Pro Asp Lys Val Glu Glu Ala Asn Lys Gly Glu  
 145 150 155 160  
 Asn Thr Ser Leu Leu His Pro Val Ser Leu His Gly Met Asp Asp Pro  
 165 170 175  
 Glu Arg Glu Val Leu Glu Trp Arg Phe Asp Ser Arg Leu Ala Phe His  
 180 185 190  
 His Val Ala Arg Glu Leu His Pro Glu Tyr Phe Lys Asn Cys Thr Ser  
 195 200 205  
 Glu Pro Val Asp Pro Arg Leu Glu Pro Trp Lys His Pro Gly Ser Gln  
 210 215 220  
 Pro Lys Thr Ala Cys Thr Asn Cys Tyr Cys Lys Lys Cys Cys Phe His  
 225 230 235 240  
 Cys Gln Val Cys Phe Ile Thr Ala Ala Leu Gly Ile Ser Tyr Gly Arg  
 245 250 255  
 Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser Gln Thr His  
 260 265 270  
 Gln Val Ser Leu Ser Lys Gln Pro Thr Ser Gln Ser Lys Gly Glu Pro  
 275 280 285  
 Thr Gly Pro Lys Glu Thr Ser Gly His His His His His His  
 290 295 300

<210> 26

<211> 57

<212> DNA

<213> *Pichia pastoris*

<400> 26

ttcgaaacca tggccgcgga ctagtggcca ccatcaccat caccattaac ggaattc

57

<210> 27

<211> 9



<212> PRT

<213> *Pichia pastoris*

<400> 27

Thr Ser Gly His His His His His His

1

5